Precision air strike in
Kirkuk, Iraq, Operation
Ivy Cyclone

Battle Damage Assessment

The Ground Truth

By JAMES G. DIEHL *and* CHARLES E. SLOAN

Since the dawn of organized combat, assessing the effects of actions against enemies has played a key role in the prosecution and outcome of battles, campaigns, and ultimately wars. Early assessments were simple because battles were confined in space and time, so a commander could observe all developments as they occurred. As combat became more complex, especially with the increased use of joint and combined forces, assessing battle damage became correspondingly more complicated.

The difficulty of accurate damage assessment became evident during Operation *Desert Storm*, where the rapid tempo and large scale of combined operations exceeded the capabilities of the traditional ad hoc approach to battle damage assessment (BDA). In its *Final Report to Congress, Conduct of the Persian Gulf War, 1992*, the Department of Defense (DOD) cited this problem as a major lesson learned and identified BDA as a failure: "The number-one DOD finding concerning BDA was that it was slow and inadequate." Although technology has evolved since the first

Colonel James G. Diehl, USA, is a joint test director, Joint Battle Damage Assessment Joint Test and Evaluation Center. Charles E. Sloan is a senior military analyst with Computer Sciences Corporation.

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Gulf War, the assessment mission during both Operations *Enduring Freedom* and *Iraqi Freedom* was again overrun by the rapid operations tempo and endured much of the same criticism it received in the previous decade.

To address chronic BDA process issues, the Office of the Director, Strategic and Tactical Systems, chartered the Joint Battle Damage Assessment (JBDA) Joint Test and Evaluation Program in August 2000. The program subsequently fell under the cognizance

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of the Office of the Secretary of Defense, Director, Operational Test and Evaluation. The JBDA charter was to enhance current joint BDA processes to provide more timely and effective assessments of fixed and mobile targets. It began by modeling and conducting a thorough analysis of existing joint and service BDA processes, then executed joint tests over 3 years to establish a baseline analysis of current joint

processes and test the JBDA-developed enhancements applied to those baseline processes. Although the primary test venue was Exercise *Ulchi Focus Lens* (UFL '02 and '03), the program also collected and analyzed BDA data during *Enduring Freedom* and *Iraqi Freedom*. Data collection consisted of manual observation by collectors and augmentee subject matter experts at key theater nodes, semi-automated capture of planning and execution products, and automated capture of command, control, communications, computers, and intelligence (C⁴I) data.

After an iterative analysis of BDA process data collected from such sources as manual and automated systems, operator and senior leader interviews, and after-action reports, JBDA was able to document joint processes and develop and test process enhancements in three areas: command, control, communications, computers, intelligence, surveillance, and reconnaissance (C⁴ISR) interoperability; joint tactics, techniques, and procedures (TTP) for BDA; and joint BDA training. The following is an overview of the JBDA enhancements as applied to each focus area.

Precision air strike in Fallujah, Iraq, Operation *Al Fajr*

1st Marine Division Combat Camera (Thomas D. Hudzinski)

Improved Interoperability

Initial analysis of BDA data highlighted several trends in joint C⁴ISR interoperability to which enhancements were applied:

■ failure to feed immediate poststrike BDA information to air and ground component decisionmakers (especially against time-sensitive/mobile targets)

■ lack of BDA information cross-flow among joint and service component headquarters

■ limited theater visibility of damage assessment status

■ lack of emphasis on high-interest targets

■ need for more reporting paths to BDA cells

■ enhanced poststrike reporting.

Joint Battle Damage Assessment demonstrated enhancements to improve the timeliness, accuracy, and completeness of joint and combined poststrike reporting. Among them was the addition of poststrike BDA boxes to the Automated Deep Operations Coordination System (ADOCS) used by both operations and BDA intelligence personnel. Previously, Combined Air Operations Center (CAOC) BDA cell personnel were not using ADOCS to stay abreast of last-minute targeting changes to the integrated tasking order or to keep up with assessment requirements during time-sensitive/dynamic targeting. Without such knowledge, BDA assets and efforts could be wasted on invalid targets and not be available for collection on newly approved targets. JBDA worked with the Theater Precision Strike Office to add poststrike BDA, combat assessment, and restrike recommendation menus to the ADOCS Intra-Air Operations Center Target Manager software and display. This provided both operations and intelligence personnel with the means to update and maintain awareness of poststrike activity associated with specific time-sensitive and dynamic targets.

Another reporting enhancement involving improved ADOCS utilization was provided to the Combined Unconventional Warfare Task Force (CUWTF) to increase the speed and cross-flow of Special Operations Forces (SOF) direct reporting of time-sensitive and high-priority target information to both CUWTF headquarters and the

Satellite image of Baghdad prior to Operation *Iraqi Freedom*

Space Imaging

CAOC Hardened Theater Air Control Center combat operations execution floor. JBDA achieved this by replacing a manual CUWTF targeting coordination process, hampered by limited stovepipe reporting, with an ADOCS network approach that provided near-real-time reporting of SOF target detection and strike results to all joint theater ADOCS nodes. This proved to be a low-cost, high-payoff enhancement and was demonstrated during live operations in Exercise *Foal Eagle '03*. This enhancement is now permanently integrated into CUWTF operations.

Theater-wide Visibility of BDA Status

Joint Battle Damage Assessment discovered that the primary reason theater operations and intelligence personnel did not have up-to-date situational awareness on the overall BDA mission was that parts of BDA resided in numerous unconnected or unlinked locations. This amounted to a needle in a haystack for intelligence analysts and operators seeking assessment information. Furthermore, the existence of component-specific systems such as ADOCS, Interim Targeting Solution (ITS), and All-Source Analysis System (ASAS) negated the possibility of a single database management system for joint BDA.

The answer was to establish a single repository of assessment information by developing a Web-enabled database to accomplish remote query and storage of data read from ADOCS, ITS, and ASAS. That allows users to see specific target information such as the identification number, name, next mission number scheduled against it, *hit* or *no hit* status, BDA, re-attack recommendation, and intelligence, surveillance, and reconnaissance (ISR) collections status. This solution is currently in place within U.S. Forces Korea (USFK) and is being incorporated into the joint targeting toolbox.

JBDA also discovered similar problems in getting the overall ground maneuver BDA status from the Ground Component Command–Combined Analysis and Control Center (GCC–CACC) PERL-based Web server. It completely rewrote the center's BDA Web page to account for enhanced TTP for managing maneuver information, providing USFK with a modern, coherently coded Web capability for tracking maneuver BDA results.

While observing the dissemination of BDA-related products on the USFK theater dissemination Web site, JBDA noted delays of up to 4 hours in posting damage assessment and battle rhythm-related products. The answer was to develop the theater intelligence dissemination battle-rhythm support Web site, another low-cost, high-payoff solution that provides one-stop shopping for damage assessment and other intelligence-related information.

Improved Joint TTP

Closely associated with the C⁴ISR interoperability problems were trends pointing to outdated or nonexistent joint BDA tactics, techniques, and procedures. JBDA developed enhancements targeted at the following deficiencies:

■ insufficient mobile/maneuver BDA TTP
■ inadequate poststrike reporting/processing TTP
■ overreliance on imagery intelligence (IMINT) for BDA
■ minimal involvement of federated partners
■ no single BDA procedures/checklists publication.

New maneuver and ground mobile target TTP. Observations made in the GCC–CACC during UFL '02 pointed to areas within the maneuver and ground mobile target (M&GMT) BDA process in need of further refinement, including enemy unit association, report submittal procedures, locations of applicable information, and specific battle rhythm requirements.

Joint BDA targeted these deficiencies by developing a detailed guide explaining the Combined Forces Command (CFC) M&GMT BDA TTP that incorporated improvements in analysis methods, reporting requirements, and the portrayal and coordination of M&GMT BDA. These changes were also incorporated into the JBDA-enhanced GCC–CACC BDA Web server.

Improved BDA template and communications for federated BDA sites. Federated BDA is a process in which other joint and national agencies around the world perform specific BDA functions in support of USFK. These functions usually pertain to some particular expertise resident in the BDA federated partners. During UFL '02, JBDA data collectors noted extensive delays in exchanging BDA-related products between USFK and its off-peninsula BDA federated partners.

The solution was to install Global Command and Control System–Korea terminals at each federated partner site and optimize the federated template for BDA information exchange. This made it possible for the USFK BDA cell and the federated partners to post, query, and collaborate on damage assessment data in support of CFC operations. This enhancement provided USFK with immediate connectivity to their federated BDA counterparts and allowed warfighters to view and collaborate on important information with up-to-the-minute timeliness.

Procedures and exercise scripting inputs for multiple intelligence sources (multi-INTS) BDA. During UFL '02, JBDA observed that intelligence analysts relied almost exclusively on imagery intelligence (IMINT) to assess BDA, even though the exercise simulation systems supporting UFL were capable of generating reports from over 50 non-IMINT collection assets. This included theater and national signals

> **observations from *Enduring Freedom* and *Iraqi Freedom* indicated that mission reporting was plagued by nonstandard reporting formats**

intelligence assets, other electronic intelligence producers, and nontraditional, technically derived intelligence such as measurement and signature intelligence. JBDA focused on increasing interaction between the training audience and the USFK exercise modeling and simulation coordinators to provide more timely and relevant raw multi-INTS data to the intelligence analysts responsible for producing BDA.

Standardize and facilitate flow of poststrike reports to BDA cells. During UFL '02, JBDA noted that mission reports were not flowing properly from the Air Simulation Cell to the Air Component Command (ACC) BDA Cell targeting database. The primary reason was that the simulation models and the UFL '02 player databases were configured to process different versions of U.S. message text format (USMTF) 1998 and 2000. The result was a 24-hour backlog of messages and failure of the information to reach other components and federated partners until a workaround was devised.

In an attempt to resolve this situation, the JBDA staff worked with USMTF users, simulation center contractors, and USMTF program office personnel to ensure that USMTF 2000 messages were generated and validation software was installed on all C⁴I and simulation systems. JBDA also conducted a robust campaign to educate CFC and ACC active-duty and civilian operations, intelligence, and simulation support personnel on the importance of the USMTF program and directives to utilize it.

JBDA found that mission reporting and processing was not only an exercise simulation problem, but that it also was, and still is, a real-world problem. Observations from *Enduring Freedom* and *Iraqi Freedom,* along with interviews of U.S. Central Command (CENTCOM) BDA cell chiefs and after-action lessons learned, all indicated that mission reporting was plagued by nonstandard reporting formats employed by service, joint component, and headquarters-level intelligence cells. Since *Iraqi Freedom*, JBDA has worked closely with the Air Force Combat Assessment Working Group (CAWG), the Joint Chiefs of Staff lead agent for joint combat assessment solutions, to develop a permanent approach to mission reporting standardization. More recently, U.S. Joint Forces Command (J–7/8) and JBDA have teamed to forward a transitional change proposal containing poststrike reporting enhancements to the Joint Requirements Oversight Council for approval.

Improved Joint BDA Training

Joint BDA documented a chronic problem with untrained or unqualified augmentees arriving in the USFK theater to perform BDA cell functions during UFL exercises. Worse, the same problem plagued the CENTCOM BDA mission throughout *Enduring Freedom* and *Iraqi Freedom*, even though the shortfall was thoroughly documented. The problem of untrained augmentees remained a lesson not learned from *Desert Storm*, Kosovo, and even *Enduring Freedom*. JBDA developed several enhancements to improve this issue.

Air Force Tactical Air Control Party conducting bomb crater analysis in Iraq

U.S. Air Force (Shane A. Cuomo)

Designated Reserve BDA units. Early on in its program, JBDA was a proponent for identifying and training designated Reserve units to augment theater BDA cells in time of crisis or during major exercises. For UFL exercises, JBDA coordinated an enhancement with the Air Force Reserve 701st Combat Operations Squadron to have a core of dedicated, trained BDA augmentees available on a recurring basis to the ACC BDA Cell. This habitual relationship reduced standup times and provided augmentees familiar with the gaining organization's personnel and TTP. This enhancement will be forwarded to CENTCOM and other theaters for adoption.

A joint guide. JBDA noted during UFL '02 that inexperienced augmentees arrived in theater without a full understanding of theater BDA processes or their own responsibilities within the cells. Accordingly, JBDA developed and published the USFK *Joint BDA Guide* to assist inexperienced augmentees. Other theaters, such as CENTCOM and U.S. European Command, also requested guides. In response, JBDA teamed with U.S. Joint Forces Command to produce a guide applicable to all theaters, *Commander's Handbook for Joint Battle Damage Assessment.*

Computer-based training for BDA augmentees. To provide untrained augmentees training in BDA cell processes and procedures, JBDA developed computer-based, self-study course on compact disks to provide rapid familiarization for joint and service exercise augmentees. The goals were increased personnel efficiency during training, more rapid training, and accelerated learning and performance curves within the cells, resulting in improved BDA support to the joint force commander. This course was also provided to CENTCOM BDA augmentees during *Enduring Freedom* and *Iraqi Freedom* with positive feedback. In many cases, augmentees considered the disks a primary reference while performing their missions.

The Future of Joint BDA

The JBDA program has significantly impacted a wide range of BDA issues through such activities as extensive background study, data collection and analysis, enhancement development, warfighter symposiums, and senior leader mentorship. That said, the program was designed from the start to be a limited look at a mission that remains as formidable an undertaking as when it began in 2000. As JBDA prepares to close down, other issues remain for consideration by those now stepping up to the BDA plate.

Is BDA really broken? It comes as no surprise that *Enduring Freedom* and *Iraqi Freedom* lessons learned highlighted many failures in the joint BDA mission. A look back will show that the mission has rarely been judged as successful. Although there have been several technical and process improvements, assessment still receives failing grades regardless of whether people even understand the mission. In defense of BDA, however, there is also little historical evidence of any formal attempt to fix it or to simply agree what it is. Indeed, joint organizations such as the Joint Chiefs of Staff-sponsored Combat Assessment Working Group are still trying to define it.

If the mission is not made a priority during operational and crisis action planning; if, from day one of a contingency, cells are hopelessly undermanned with unqualified personnel trying to keep pace with the overwhelming information flow of a major operation; if theater and federated coordination procedures are not regularly exercised together before going into combat; and if it is common knowledge beforehand that current C^{4}I systems and databases cannot talk to joint theater or federated BDA partners, then it is not BDA that is broken, but rather the approach to conducting it. If the approach is fixed, BDA will be fixed.

BDA is not just an "intel thing." The BDA mission, if it is going to integrate into an effects-based operations culture, must become an integrated operations/intelligence function that begins with and continuously feeds back to support the commanders' strategy. To realize this, commanders must provide the personal oversight to fuse both operations and intelligence to create a new, unified culture that tolerates no planning or execution that is not operations/intelligence–centric. This paradigm shift will most probably come slowly and with significant growing pains, but in the end it will help reduce the number of Joint Staff teams to one and put the *unified* back into *command.*

Prioritizing collection assets. One of the ongoing challenges for joint commanders is the effective employment of limited ISR collection assets
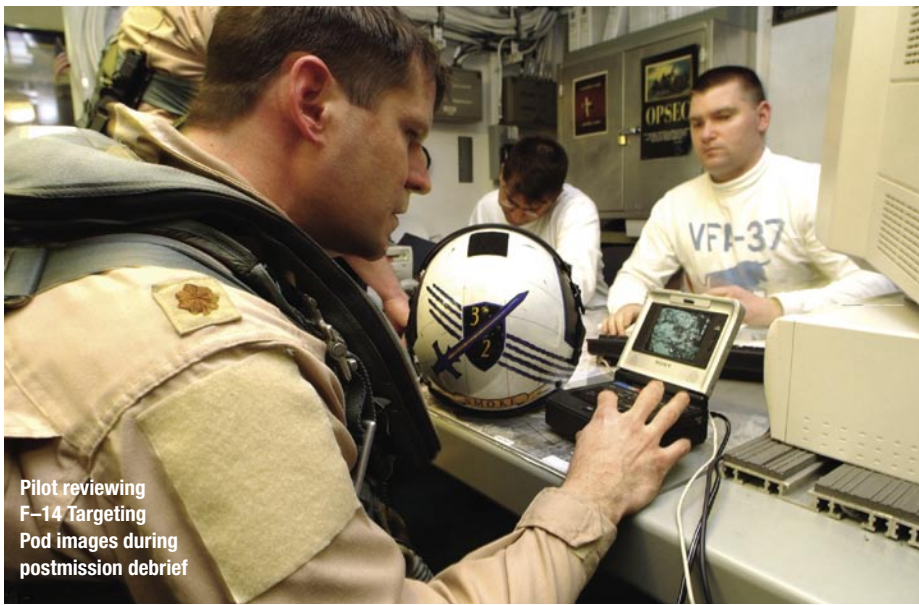
Pilot reviewing
F–14 Targeting
Pod images during
postmission debrief

U.S. Navy (Michael W. Pendergrass)

to meet both surveillance (targeting) and BDA demands. By nature, these two divergent missions conflict during both planning and execution because there never seem to be enough ISR assets on hand to meet the requirements of both simultaneously. This creates a continuous tug-of-war between those looking for tomorrow's targets and those providing BDA collection on today's targets.

Many believe that overemphasis of BDA collection denigrates the target acquisition effort because it consumes too many assets that can be used more proactively for surveillance and targeting. They also point to the increasing accuracy of precision-guided munitions (PGMs) and the current trend by joint commanders to accept predictive PGM damage results (for example, from computer modeling and/or risk assessment) versus waiting for formal BDA reporting before making a decision.

Others disagree with basing decisions solely on predictive BDA and warn that BDA is only one part of the overall combat assessment mission. Thus, it is the combat assessment process, not merely predictive BDA (or even actual BDA), that more accurately determines a target's poststrike functional status and, where this target is part of a larger target system, whether poststrike effects met theater objectives against that target system.

The answer to this dilemma lies in investing the time and effort to re-engineer the current joint ISR piece of battle rhythm planning, and provide commanders with a new ISR planning and execution framework. This new framework, by design, would incorporate the attributes of an effects-based operations culture such as unified operations/intelligence-centric planning and execution processes, coherent ISR strategy-to-task planning methodology, and daily tasking orders that are resilient under the stress of execution, yet flexible enough to accommodate dynamic changes.

Collateral damage and the media war. The advent of real-time and near-real-time worldwide combat reporting, especially from embedded news reporters, significantly increases the impact that collateral damage places on the BDA mission. Current exercises do not usually involve media participation to provide commanders with realistic training scenarios to operate in this environment. Observations from *Enduring Freedom* and *Iraqi Freedom* indicated that collateral damage is now an integral part of BDA, and analysts now devote considerable effort to evaluating pre-targeting collateral damage risk in addition to poststrike BDA. Both missions will demand rapid response timelines and a much wider focus pro-

vided by the traditional BDA approach. What is not damaged may become as important as what is.

Another challenge for the BDA mission comes from the use of smaller weapons or nonlethal attacks to avoid collateral damage. Performing BDA on these confined attacks is more difficult because the resulting damage signatures are harder to detect and analyze. This points to the significance of employing a strategy of diverse, multiple intelligence sources along with coherent and responsive all-source intelligence fusion and dissemination to meet collateral damage priorities.

Whether we know if battle damage assessment is broken, or what the term really means, the mission remains ripe for process improvement. Over the past 4 years, joint battle damage assessment has contributed to this improvement by demonstrating numerous enhancements. Some are now in place in operational theaters and others are in transitional phases, but all are contributing to the overall effectiveness of the battle damage and combat assessment missions.

Nevertheless, the need still exists for a combined effort, from services to joint staffs, to codify mission definitions, build an off-the-shelf framework of BDA and combat assessment processes, and establish a truly integrated operations/intelligence warfighting approach. Now would be a great time and the aforementioned recommendations would certainly be acceptable in an effects-based operations culture. More important than reengineering, however, is the need to educate joint commanders and their staffs on BDA and combat assessment because as long as BDA is viewed as primarily an intelligence function, we will continue to fight ourselves while we fight the enemy. **JFQ**